Problem L: The Grail Trials (II)

The second trial is *The Word of God*. Indy has to cross over a section of the cave where the floor is covered with letters. Only the correct letters, formed by the Latin spelling of the word "Jehovah", are safe positions. If Indy steps on the wrong letter, the floor under him would crumble, and he could fall to his death.

Figure 1: The word of God: only in the footsteps of God will he proceed

Now, we will represent the floor as a grid of characters where all cells are filled with either an uppercase letter from the English alphabet, or with a vertical line (|). The grid will be formed in such a way that, when you look at its diagonals, they alternate between letters-only and vertical bars-only, but you can't make assumptions about which kind of diagonal comes first.

Indy starts from the bottom of the grid, and has to move all the way to the top, and from any given position, his jumping ability allows him to reach one of three alternatives: a cell one row above and one column to the right, or a cell one row above and one column to the left, or a cell two rows above and in the same column.

For example, in the following grid:

```
|X|X|
X|D|X
|B|C|
X|A|X
```

Indy can jump from position **A**, to positions **B**, **C** and **D**, but not to any of the cells filled with **X**. Because of the way the trap is rigged, Indy always has to start from the bottom row, and always has to finish on the top row.

You are given the original word used to create the floor; Indy can't step on any letter that is *not* part of that word. If Indy wants to cross the trap always moving forward (without jumping back or to the sides), in how many different ways can he do it?

Input

Input starts with a positive integer **T**, that denotes the number of test cases ($T \leq 500$).

Each case starts with two integers in a single line: **R** and **C**, which represent the number of rows and columns of the grid.

$1 \leq R, C \leq 80$

The second line will contain a word formed by uppercase letters only. The length of this word will be between 1 and 50.

The next R lines will contain C characters, forming a valid grid as described above.

Output

For each test case, print the case number, and then print the number of different ways in which Indy can cross the trap, moving only forward.

As the result could be a very large number, print the answer modulo 1000003.

Sample Input

```
2
7 8
IEHOVAH
|H|X|H|W
G|A|A|B|
|M|V|Z|D
U|O|I|B|
|P|H|F|B
V|E|T|E|
|J|I|K|R
5 5
AEIOU
A|E|I
|O|U|
E|X|U
|A|E|
U|A|I
```

Output for Sample Input

```
Case 1: 19
Case 2: 26
```